



UNITED STATES DEPARTMENT OF COMMERCE
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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09/507,465 02/22/00 LANGLEY

R M4065.0018/P

EXAMINER

IM52/0307

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BAILED A

ART UNIT

PAPER NUMBER

1765

DATE MAILED:

03/07/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.

09/507,465

Applicant(s)

LANGLEY ET AL.

Examiner

Andrea M. Baird

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 10-16 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 10-16 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claims ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are objected to by the Examiner.
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

- 15) ☒ Notice of References Cited (PTO-892)
- 16) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 17) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____
- 18) ☐ Interview Summary (PTO-413) Paper No(s) ____
- 19) ☐ Notice of Informal Patent Application (PTO-152)
- 20) ☐ Other:

DETAILED ACTION

Claim Objections

1. Claim 15 is objected to because of the following informalities: In line 4, "water" should be "wafer". Appropriate correction is required.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

4. Claims 10-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Saeki et al. (US 5,460,684) in view of Nakayama et al. (US 4,902,531).

Saeki et al. discloses a plasma etching apparatus used to etch a semiconductor wafer.

The plasma etching apparatus includes an electrostatic chuck, for attracting and holding a semiconductor wafer, provided on a susceptor. See abstract. Saeki et al.'s electrostatic chuck and susceptor read on applicant's chuck and pedestal, respectively.

Saeki et al. discloses that the plasma etching apparatus contains a cooling block **21** with a bore **22**, wherein bore **22** is used to circulate coolant. See column 4, lines 4-6. Saeki et al. also discloses that susceptor **2** is fixed on cooling block **21**. See column 4, lines 11-18. Saeki et al.'s susceptor **2** reads on applicant's pedestal. In column 4, lines 6-10, Saeki et al.'s states that introduction tube **22a**, which supplies coolant into the process chamber, and an exhaustion tube **22b**, which removes coolant from the process chamber, are connected to bore **22**. This reads on applicant's steps of internally cooling the chuck.

Saeki et al. discloses that the semiconductor wafer is unloaded after completion of etching. Saeki et al. shows that pusher pins **27**, which are actuated by driving means **26**, project so as to push up the wafer from susceptor **2**. See column 4, lines 54-56; and column 5, lines 51-62. This reads on applicant's step of unloading the wafer from the chuck after plasma etching.

Claim 10 differs from Saeki et al. by specifying that the pedestal is rotating during plasma etching of the wafer. Nakayama et al. discloses a vacuum processing method and apparatus wherein a susceptor, which supports a substrate to be processed and is fixed to a rotating shaft, is contained within a vacuum chamber. See column 4, lines 65-68; column 5, lines 12-17; and abstract. Nakayama et al.'s susceptor reads on applicant's pedestal. It is the examiner's position that a person having ordinary skill in the art at the time of the claimed invention would have found it obvious to modify Saeki et al. by using a rotating susceptor, as disclosed by Nakayama et al., because it would have been anticipated to produce an expected result.

Claim 15 specifies that the process parameters be initialized. Applicant states that the process parameters include gas flow, process chamber pressure, wafer temperature, and pedestal

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rotation speed. Saeki et al. states that process gas flow is supplied and stopped with the use of a high-frequency power supply; process chamber pressure is set and maintained with the use of a vacuum pump; and wafer temperature is set with the use of a heat conductive gas and a cooling block. See column 3, lines 62-66; column 5, lines 26-53. Nakayama et al. states that the pedestal rotation speed is monitored with the use of a rotation motor. See column 5, lines 20-24. It is the examiner's position that a person having ordinary skill in the art at the time of the claimed invention would have found it obvious to control the process parameters, as listed in claim 15, because control of each process parameter would be inherent in plasma etching methods and apparatuses and their combination would have been anticipated to produce an expected result.

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andrea M. Baird whose telephone number is (703) 305-3542.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Benjamin L. Utech can be reached at (703) 308-3836. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 305-3599 for regular communications and (703) 305-6078 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

amb
March 6, 2001


BENJAMIN L. UTECH
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700